

PROBLEM:

For the following system:

$$H(z) = \frac{1 - z^{-1}}{1 + 0.9z^{-1}}$$

determine the time-domain (n) and frequency-domain $(\hat{\omega})$ behavior.

- (a) The inverse *z*-transform of H(z) is the impulse response h[n]. Determine the inverse *z*-transform for H(z) as a mathematical formula, and sketch the first five values of the impulse response, h[n].
- (b) Make a sketch of the magnitude of the frequency response over the appropriate range for $\hat{\omega}$. Label the peak value and the locations of any zeros. Is the filter low-pass or high-pass?
- (c) (Optional) Use freqz or the pez GUI from the lab to verify your answer.

McClellan, Schafer and Yoder, Signal Processing First, ISBN 0-13-065562-7. Prentice Hall, Upper Saddle River, NJ 07458. (c) 2003 Pearson Education, Inc.